BIG BROTHER IS WATCHING!

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On-board crash event recorders monitor a vast amount of vehicle accident data. But they also jeopardize your privacy, say critics.

They're cost-effective, widely praised by safety engineers and may help make future airbag systems even more capable. But crash event recorders, the so-called "black boxes" appearing on more and more new vehicles, are also raising big fears about personal privacy invasion.

"If someone wants to dig dirt on you, this is just one more system for them to use," observes Evan Hendricks, editor of Privacy Times in Washington, D.C. "We've seen that happen with just about any other kind of,, tern where data is recorded."

The typical black box used in automotive applications is simply software -- usually in a module -- that stores information in the seconds before a car sensor identifies a crash and fires the airbags. Voices are not recorded. Still, the ability of these systems to collect and store information without an individual's knowledge and consent is a serious concern, says Hendricks.

"There's privacy law in place here, as there is in other countries, that requires an organization to get your consent before they use the information that they have gathered about you," he notes. Such information could be used against drivers in litigation, critics fear.

Privacy advocates are specifically worried about the ability to track individuals using a combination of on-board electronics and GPS-based systems, rather than digitally recording an accident profile.

"I would be concerned about the nonemergency uses," asserts David Sobel, an attorney with the Electronic Privacy Information Center in Washington. He fears that one day police agencies will build in a capability to monitor a given vehicle at any time, and determine its speed and location While he has fewer concerns about accident recording features, he cautions that "people ought to have the ability to control any system that collects information about them."

Crash event recorders should thus be optional, not mandatory, he says. But as with any new technology, the courts or Congress will have to decide whether the data collected by the black boxes is admissible as evidence.

"I don't want a car that rats on me," is how New York Times columnist William

Satire sees it. "Down that slippery slope of secret surveillance," Satire wrote recently, "is a car that constantly records my speed, or sneakily tapes my private profanity at the guy who cuts in front of me, or reports me to the FCC for failure to install a cell phone."

While Satire and many others believe the slippery slope is approaching, experts say it's not quite here -- yet. "There has been speculation that vehicle black boxes are capable of taking snapshots of drivers' habits," comments Dave Helton, forward engineering manager at Delphi Delco Electronics Systems in Kokomo, Ind. "That's not our box."

Delco does produce a family of black boxes for Formula I race cars which monitor the behavior of the vehicle before a critical event, such as a crash, occurs. That's the exception, Typically, Delphi Delco says its engine controllers spend about 50% of their time running the engine -- injecting fuel, measuring air and triggering the ignition system. The other 50% of the time the box is sitting there meeting legislative-directed diagnostics, such as monitoring the quality of the combustion and managing evaporative emissions.

Since the information is there, though, some are reportedly in favor of using it for monitoring the vehicle itself. In terms of powertrain electronics, the most intrusive scenarios come from California and federal-level environmental advocates who call for the vehicle to actually broadcast to a communications center whether the vehicle is meeting emissions regulations. "Rather than just tell the driver, you tell the world," Delphi's Helton says.

"Privacy is semi-bogus ... absolute privacy can kill you," says Sun Microsystems Chairman Scott McNealy. He says he has no problem with officials using in-car technology to track drug lords or other criminals. He also wouldn't mind "tracking" teenager to make sure he isn't speeding or driving further than the McNealy household rules allow.

The automotive black itself dates back more than two decades. In 1974, General Motors Corp. introduced the first airbag systems as an option on selected vehicles. In 1994 multiple electromechanical switches were replaced by a combination of a single solid-state analog accelerometer and a computer algorithm integrated in a sensing and diagnostic module. The module also computed and stored changes in longitudinal vehicle velocity during impact, to provide an estimate of crash severity. This year some GM vehicles added the capability to record vehicle systems status data for a few seconds prior to impact.

It's true that GM's device functions like the black box recorder in airplanes, in that it collects data as a ear crashes. But when and how this information is gathered is vastly different from the more famous airline version. One, it doesn't record voices. And, two, it's not on all the time. "It only records at the time of a crash because that's what we're interested in -- the crash dynamics and what we can do to

improve both the product and the infrastructure, says Tom Mercer, a staff project engineer at the Electrical Center in GM's Technical Center in Warren, Mich.

Ford Motor Co. has a more limited version of the module in its 1999 vehicles, and DaimlerChrysler AG has a limited version that can detect whether an airbag deploys.

For automakers, there are multiple benefits to such a monitoring system. They include producing objective data for crash reconstruction, developing an objective driver behavior database, improving vehicle design, and providing a basis for regulatory and consumer information initiatives.

Bob Lange, GMs director of engineering safety, says he wants to use the information to better understand the injuries of people of all ages in crashes, so that vehicles can be designed to reduce the likelihood of injuries. "If we can understand crashes better, we can have better sensors, better airbags," notes John Hinch, a research engineer at the National Highway Traffic Safety Administration.

Overall, on-board crash event recorders offer great opportunity to improve safety, asserts Dr. Jeffrey Augenstein, a professor of surgery and director of the William Lehman Injury Research Center at the University of Miami.
James Hall, chairman of the National Transportation Safety Board, says it's time for all modes of transportation to realize the unlimited potential that recorder technology has to offer, both in terms of economics and safety.

Looking ahead, it's very likely even more information will be added to the data load with the addition of occupant sensing. And even further out is the possibility of combining the airbag system with a form of keyless entry known as the Smartcard. The card performs an electronic "handshake" with the vehicle, allowing entry and ignition start. A downloadable loadable health profile could be added to the card's memory chip. That information could be passed to the airbag controller to essentially tailor airbag release to the individual.

"It's a never ending story," says Kenneth Francis, director of safety systems at Siemens Automotive in Auburn Hills, Mich. But is it a story you want everyone to read, including Big Brother?